

MAKING GREENER MATERIAL CHOICES



Healthy Materials, And the Alternative

Rebuild Green Expo
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Healthy Building Science, Inc.

What is a sustainable material?



- Minimally processed
- Low embodied carbon
- Energy efficient
- Regionally harvested
- Rapidly renewable
- Healthy
 - Ecology - upstream, downstream
 - People - upstream, downstream
 - During/After Fire?

Priorities - Canadian Lung Assoc.

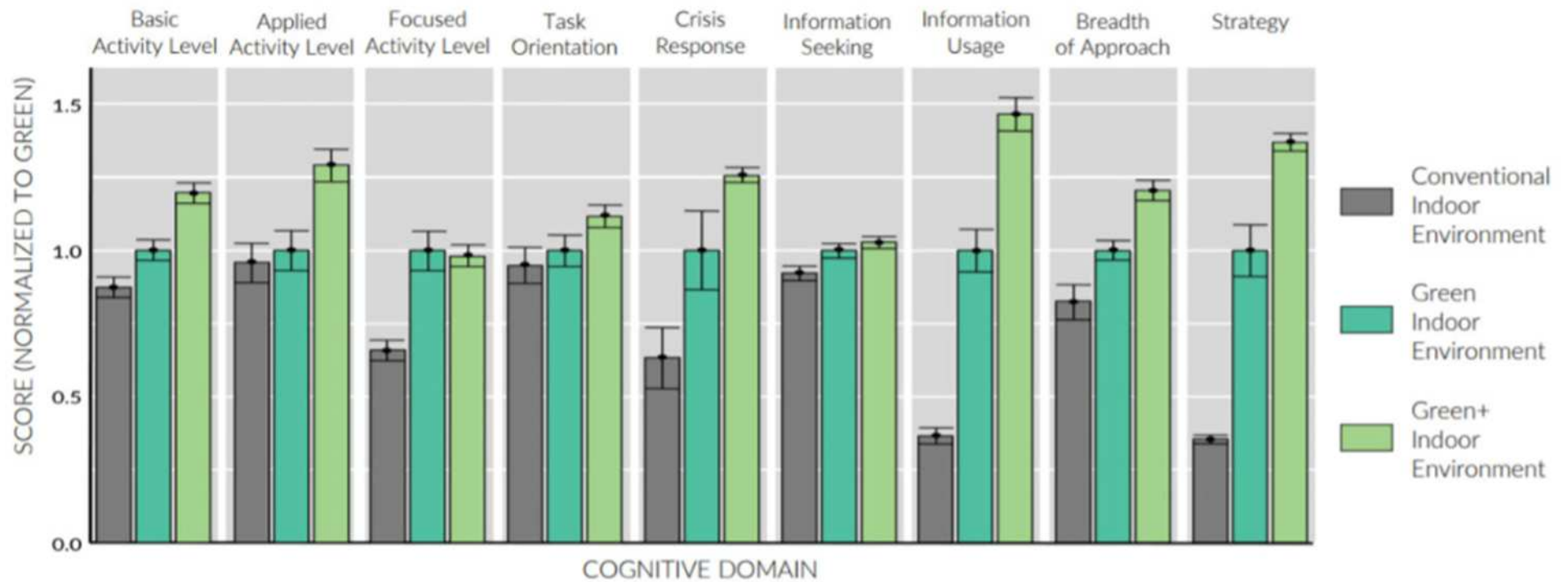


“When you can’t breath,
nothing else matters.”

Why?



IMPACTS OF INDOOR ENVIRONMENT ON COGNITIVE FUNCTION



Good IEQ Makes a Difference!

When To Engage



Design Phase

- Architect
- Interior Designer?
- Decorator?
- Specifications

Construction Phase

- Quality Control
- Green Police

Pre-Occupancy

- Commissioning & Testing
- Green Cleaning

engage!



Construction IAQ - Assess



Lead

Is Your Home Lead Safe?



Was your home built before 1978?



Do you have a child younger than age 6?



Are you worried about lead in your water?

If you answered yes to any of these questions, read more below to learn how to keep your home and children safe.

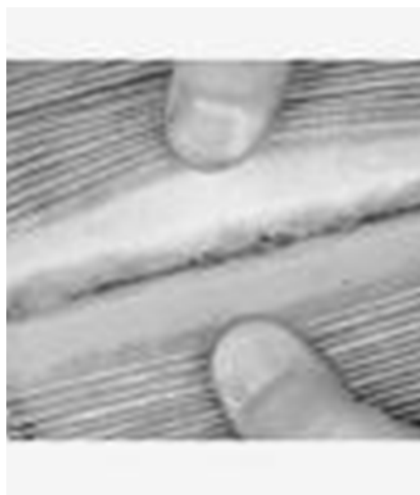
Asbestos



Are there nasties? Low- & High-Tech



Low-tech



High-tech

Material Selection Process



Building Biology Principles:

- Natural and unadulterated building materials
- Humidity-buffering materials
- Low moisture content of new materials
- Materials with low radioactivity

Material Selection Process



Who ultimately decides:

- Designer of record
- Builder of record
- Owner

Process of Review:

- Questionnaire
- How deep
- What cycles of life matter most
- Chamber testing

Transparency:

- Product disclosures
- Review process
- Limitation of liability

Material Selection Process



Who's Health?

- Family and pets
- Neighbors
- Environment
- Manufacturing
- Construction
- Emergency workers
- Maintenance personnel



Healthy Building Materials 101



Living Building Challenge

“The project cannot contain any of the following...”

- Asbestos
- Cadmium
- Chlorinated Polyethylene and Chlorosulfonated Polyethylene⁴³
- Chlorofluorocarbons (CFCs)
- Chloroprene (Neoprene)
- Formaldehyde (added)
- Halogenated Flame Retardants⁴⁴
- Hydrochlorofluorocarbons (HCFCs)
- Lead (added)
- Mercury
- Petrochemical Fertilizers and Pesticides⁴⁵
- Phthalates
- Polyvinyl Chloride (PVC)
- Wood treatments containing Creosote, Arsenic or Pentachlorophenol



What standard
“green” materials
contain these
ingredients?

Healthy Building Materials 101



Living Building Challenge

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- Wood treatments containing Creosol



MSDS Isn't Enough



Material

Material
Safety
Data
Sheets



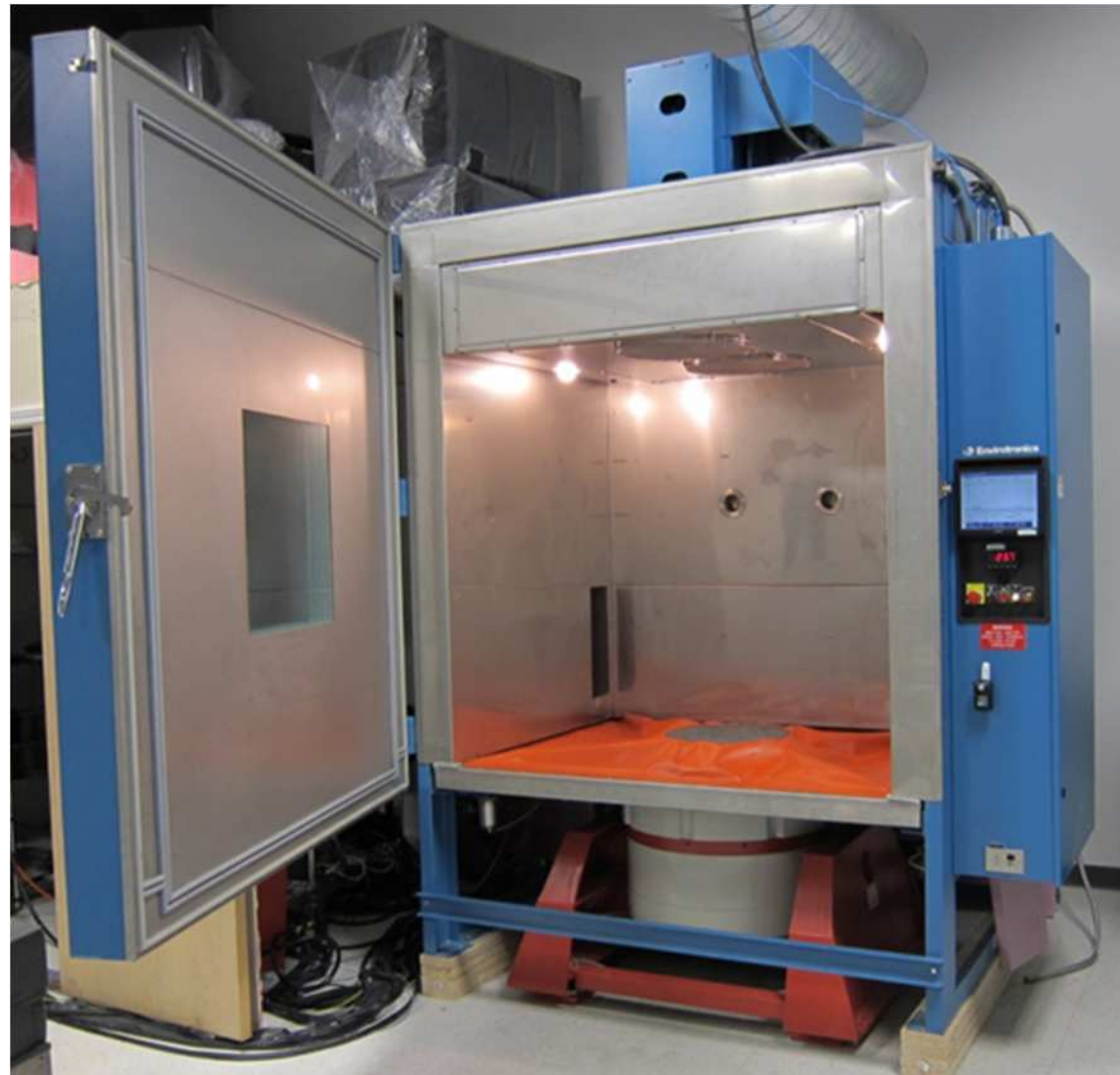
Healthy Building Materials 101



Health Product Declaration



Chamber Testing = Sure Thing



4th Case Study



Hot granite?

	Count	Minute	#/min	% over Baseline	Pass / Fail
Outside Baseline	280	20	14	0%	
Luce de Luna	282	20	14	1%	Pass
Azule Macaubas	297	20	15	6%	Pass
Ming Green Light	279	20	14	0%	Pass
	Count	Minute	#/min		
Outside Baseline Average	277	20	14		
Pearl White - Average	311	20	16	12%	Pass
Van Gogh	390	20	20	41%	Pass
Stairs - Average	432	20	22	56%	Retest
Crema Bordeaux	845	20	42	205%	Fail



Managing IAQ Best Practices



Are there nasties? (Assess)



Control nasties (6 Strategies)



Avoid New Nasties #1 (Material Selection)



Avoid nasties #2 (Ventilation)



Live healthily ever after...

Don't just trust the team...



Most Design/Build Teams Need Help!

“When you can’t breath,
nothing else matters.”

THANK YOU &
Be Safe!

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MAKING GREENER MATERIAL CHOICES



Generally, prefer wood, stone, and natural fibers and plant based finishes

Carefully consider plastic finish materials and sealants

MAKING GREENER MATERIAL CHOICES

- Use the HOMEFREE SPECIFICATION by Healthy Building Network
- OTHER RESOURCES: BuildingGreen, Pharos, CalGreen, Green Science Policy Institutes
- LOCAL STORES:
 - Hendricksen Natürlich Flooring Sebastopol.
 - Natural Home Products, Rohnert Park:
<http://www.naturalhomeproducts.com/index.html>
 - Transmineral USA, Petaluma (lime plasters, paints, putty, and more): <http://limes.us/>
 - Auro outlet in Petaluma
 - Friedman's some green building materials
 - Pine Street Interiors, Sausalito
 - EcoHome Improvement, Berkeley

HOMEFREE SPECIFICATIONS

ANTIMICROBIALS:

- They are pesticides
- A few names: Tricoslan, Microban, Silver Nanoparticles
- Where are they?
 - PAINTS, SEALANTS, GROUT, CAULK.
 - CUTTING BOARDS, DOOR KNOBS, COUNTERTOPS
 - TEXTILES, CARPET FIBERS, FLEXIBLE PVC
 - WOOD PRODUCTS
- In many cases, it is advertised and so easier to avoid

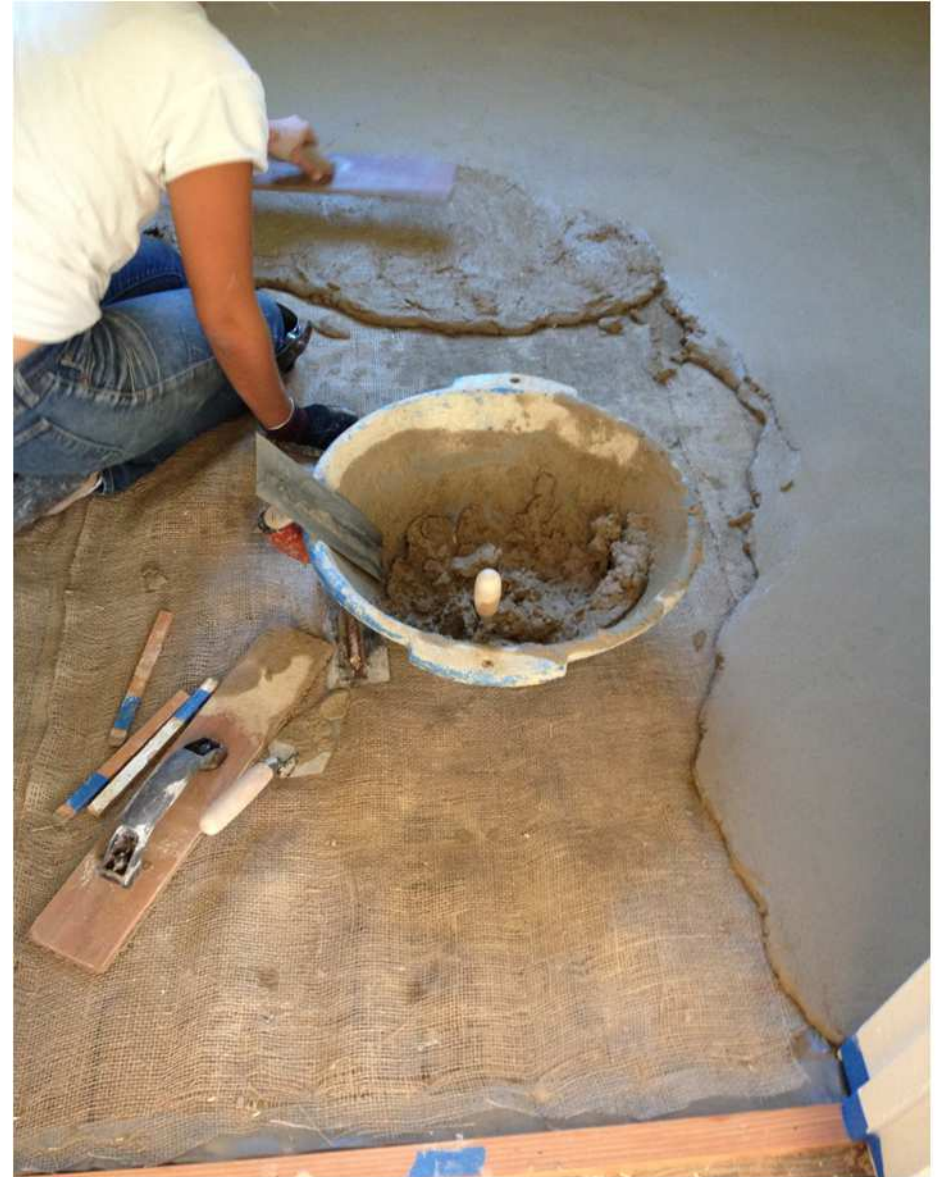
HOMEFREE SPECIFICATIONS

FLOORING: Best to use solid wood, bamboo, earth or polished concrete

- Use plant based finishes such as Rubio Monocoat, Linseed oil and beeswax.
- Mineral silicate with polished concrete



Bob Theis Architect



Massey Burke Construction

HOMEFREE SPECIFICATIONS



Bob Theis Architect

PAINTS:

- Avoid VOCs and minimize preservatives
- A few examples: AFM Safecoat, Colorhouse, Milkpaint
- Some tints are high in VOCs
- Paint free finishes such as plaster, clay, wood, and tadelakt shown here

HOMEFREE SPECIFICATIONS

Paint Free finish: diamond coat plaster over drywall



Leger Wanaselja Architecture

HOMEFREE SPECIFICATIONS

Specify natural gypsum drywall only, or, no drywall at all



DeBoer Architects

THERMAL INSULATION

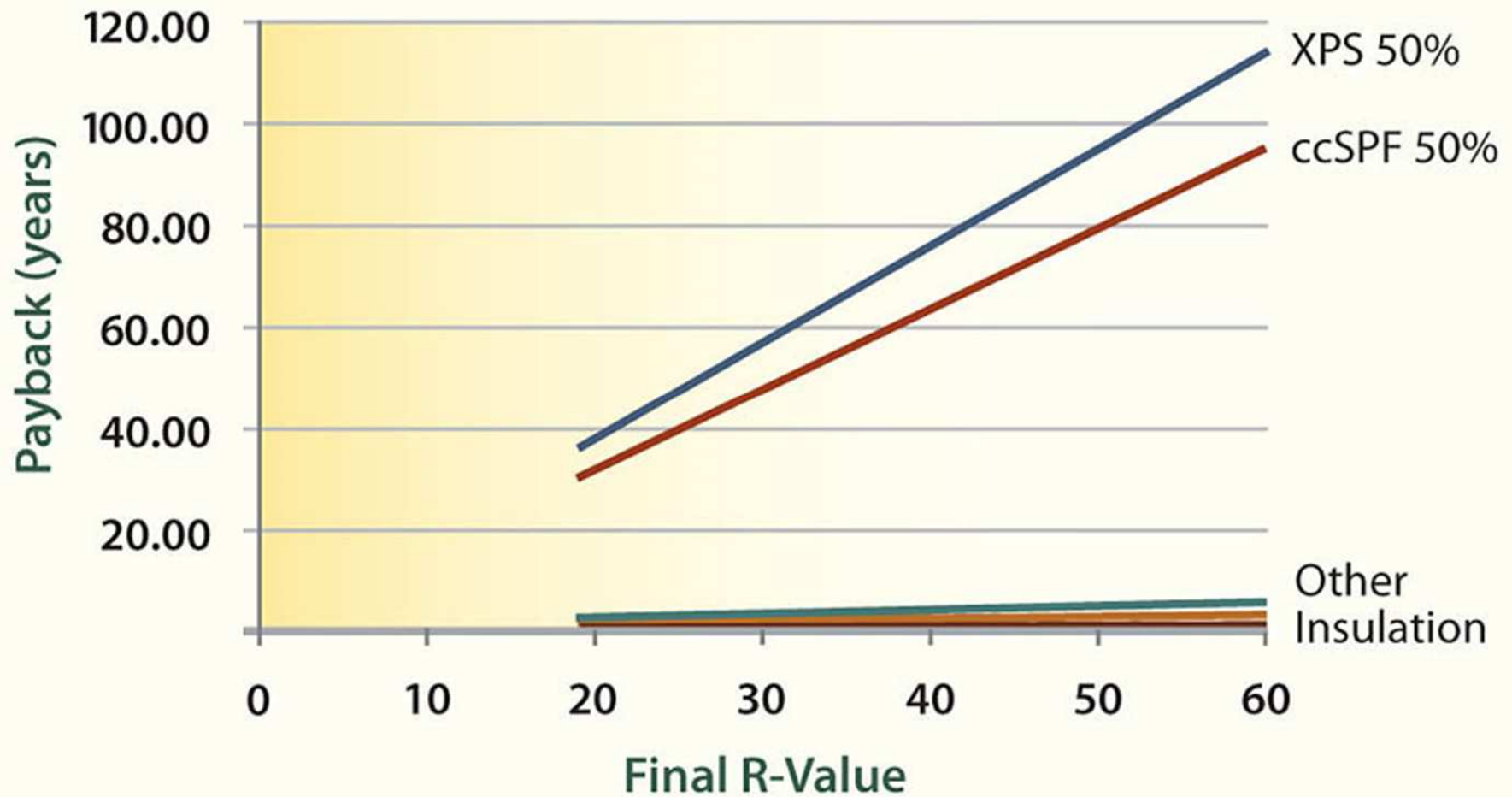
Saves energy, improves comfort and carbon footprint of manufacture is repaid in most cases with 5 years of energy savings.



Leger Wanaselja Architecture

Insulation: Global Warming potential

Lifetime GWP Payback XPS & SPF due to release of HFC blowing agents



Insulation: Toxicity Issues

- Halogenated Flame Retardants
 - Rigid plastic foam
 - Spray foam
- Flammability and Fire Hazards
 - Rigid Foam
 - Spray foam
- Formaldehyde
 - Some fiberglass, though most manufacturers have phased it out
 - More common in rigid mineral wool though also phasing out



Insulation: Blown in Cellulose



Leger Wanaselja Architecture

- BuildingGreen Top Pick for residential cavity fill
- Lowest carbon footprint
- Recycled product
- Low toxicity of flame retardant, borate
- Relatively inexpensive for high performance
- Use air or water as blowing agent

Insulation: Cork

- Naturally insulating
- Very low carbon footprint
- Renewable
- Damp tolerant



Insulation: Cork

Cork used as both insulation and siding.



Leger Wanaselja Architecture

Insulation: Natural Building Alternatives

- Scoria/Lava Rock
- Light clay straw
- Straw bale
- Hemp and light clay
hemp



Insulation: Rigid Mineral Wool

- Can be used in the same places as foam plastic insulation:
 - Roofs
 - Walls
 - Under concrete slabs
- Can contain formaldehyde



Greenbuilding Advisor

Insulation: Fiberglass

- Can be installed as batts or loose fiber
- Can contain formaldehyde



Greenbuilding Advisor

Air Sealing without Foam



Air-Sealing Without Foam

Tape is best, but the right caulk can also
provide a tough, reliable seal

by Terry Nordbye

- Canned foam or “gun foam” is inexpensive and easy to apply
- May provide initially good sealing, but does not hold up in the long term
- Failed air sealing (wires and pipes pulling away from foam) is difficult to fix; requires a deep retrofit

Alternatives to Spray Foam



- Cotton batt roving for bigger gaps
- Caulk for small gaps
- Tape
- Better construction



HOMEFREE SPECIFICATIONS

COUNTERTOPS

- Stone around the sink with a Carnauba Wax

CABINETS

- Salvaged oak and tanoak counters with linseed oil

DOORS

- Purebond plywood cabinets



Leger Wanaselja Architecture

HOMEFREE SPECIFICATIONS



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Glass tile, slate floor. No sealants on stone or grout

HOMEFREE SPECIFICATIONS



Leger Wanaselja Architecture

- Wood floors sealed with plant based resin from Bioshield
- Cabinets and counters with food grade linseed oil from Bioshield
- Concrete floor sealed with Mexiseal by AFM Safecoat

Avoiding Halogenated Flame Retardants

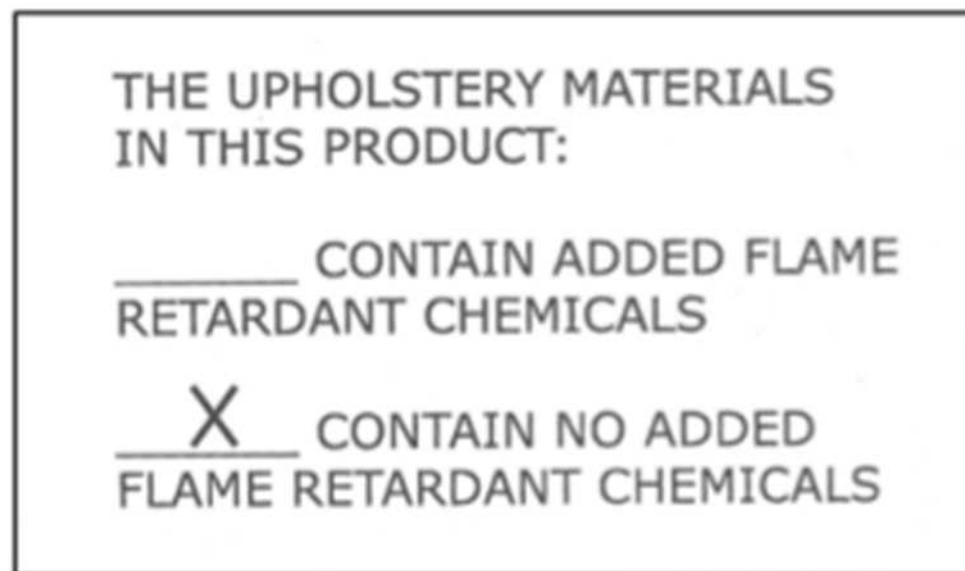


- Buy products that do not contain polyurethane foam
- Buy products manufactured before TB117 enacted, late 1970s, or after 2014



Avoiding Halogenated Flame Retardants

- Avoid products with a TB117 label
- Look for products with a TB117-2013 label



- For specific manufacturers visit Greensciencepolicy.org

Avoiding Halogenated Flame Retardants



Avoid Foam Carpet Underlayment

MAKING GREENER MATERIAL CHOICES



“Everything you can do is more important than what you can’t do.”
–Tom Lent, Healthy Building Network

Cate Leger

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Why use natural interior finishes?

















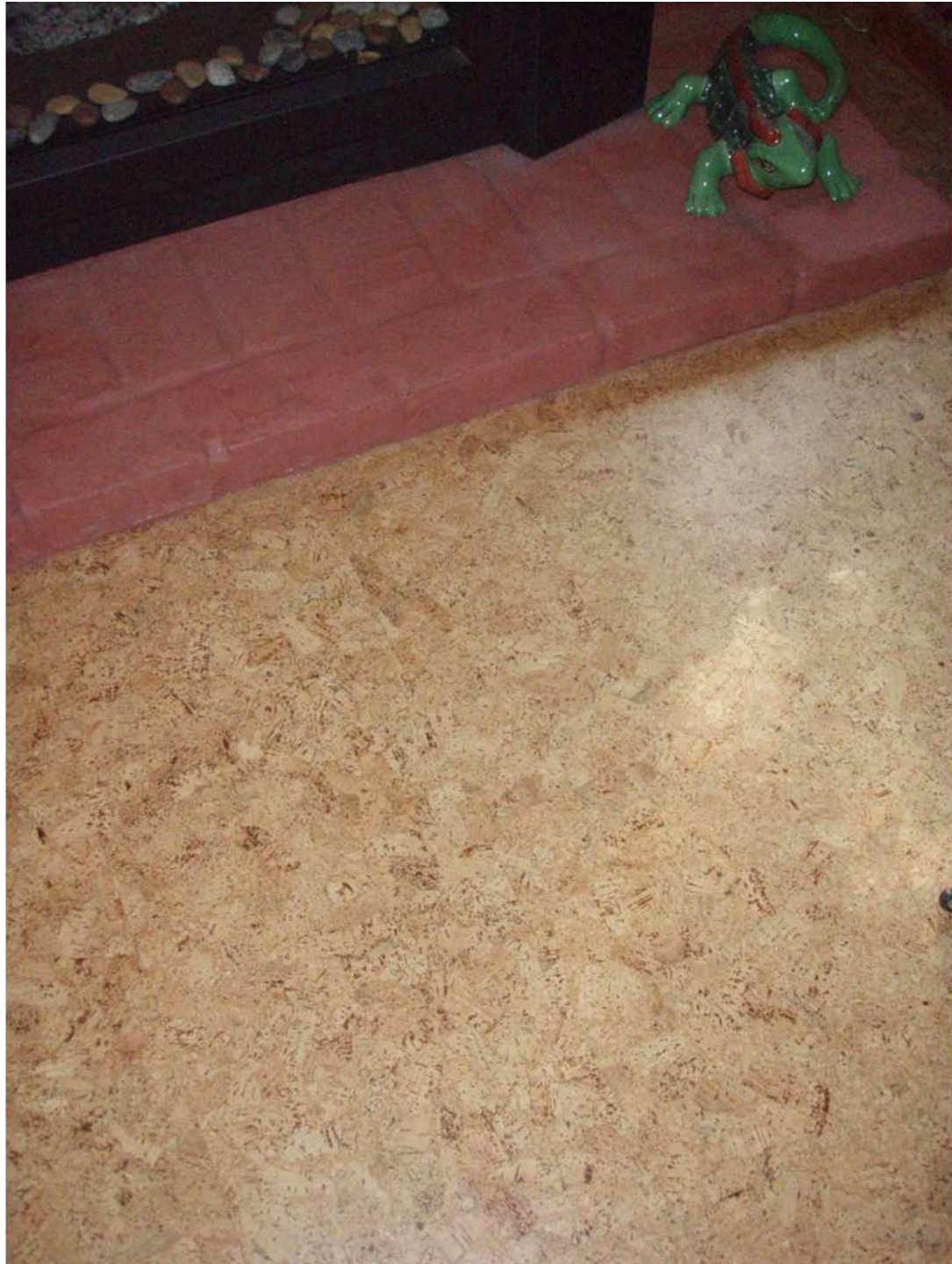


BEFORE





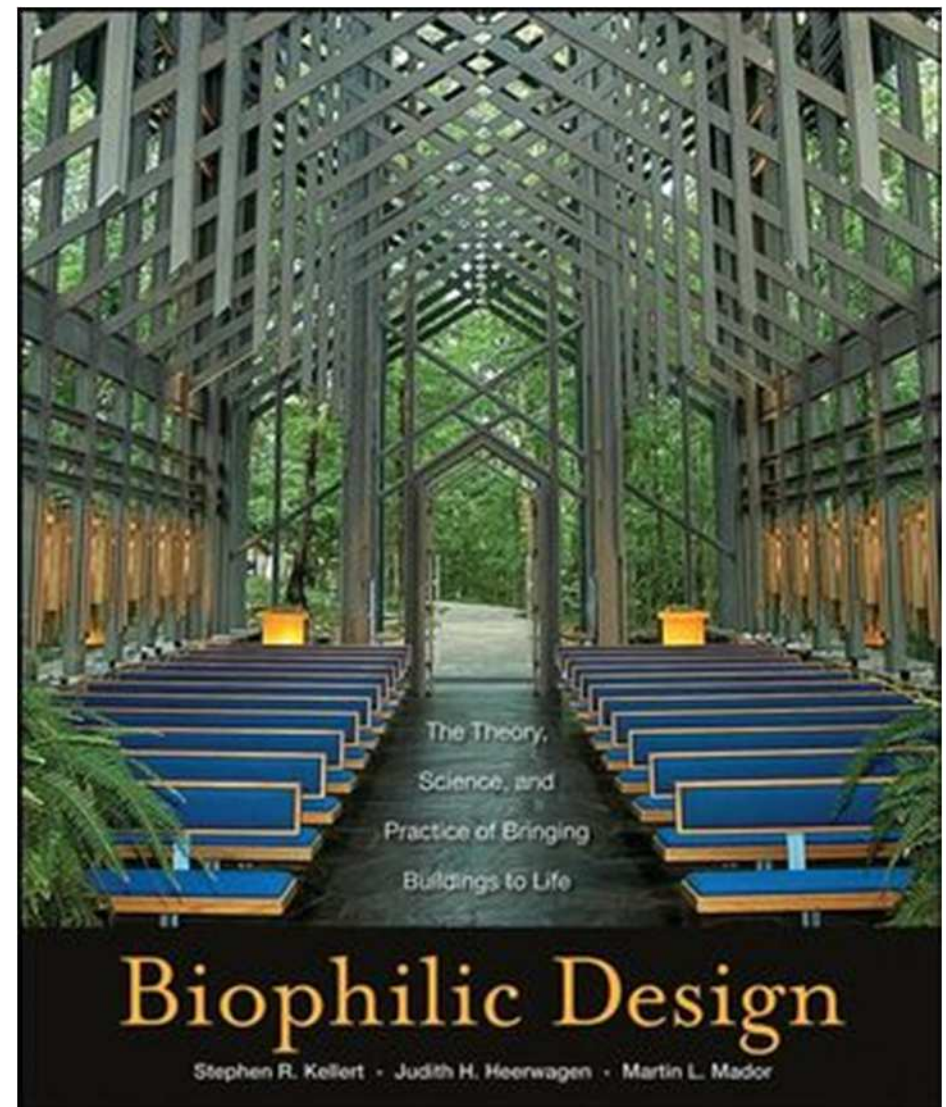
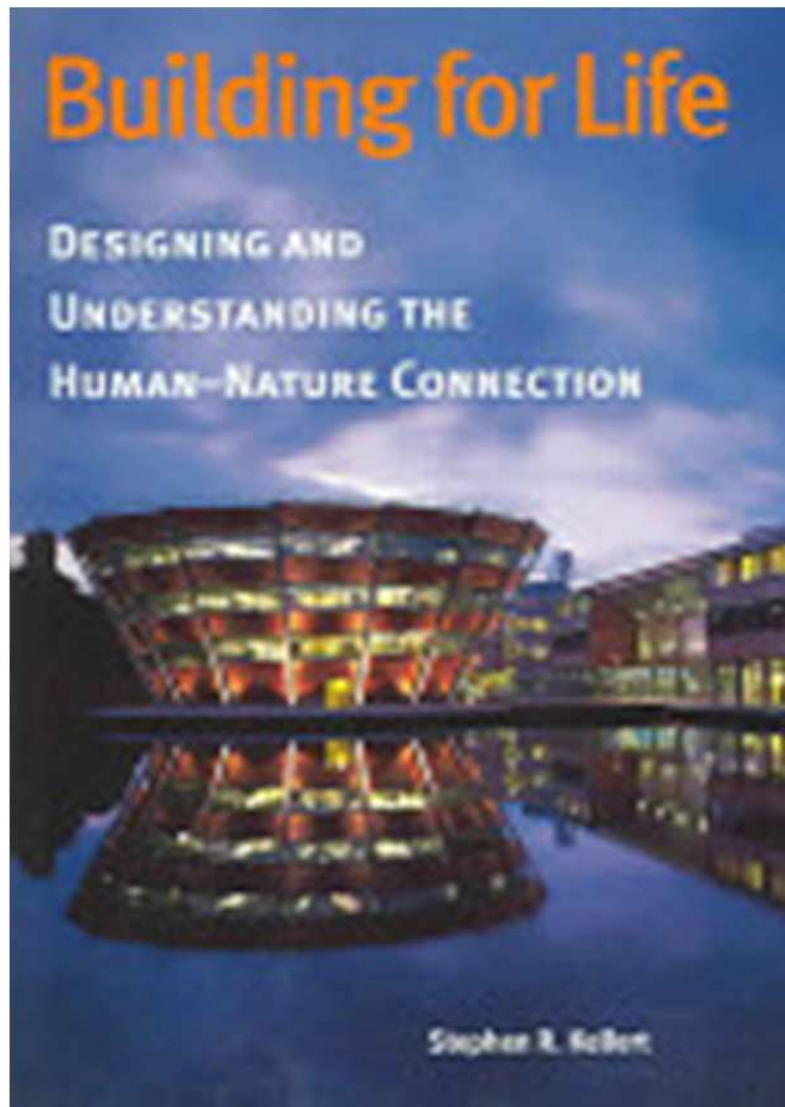


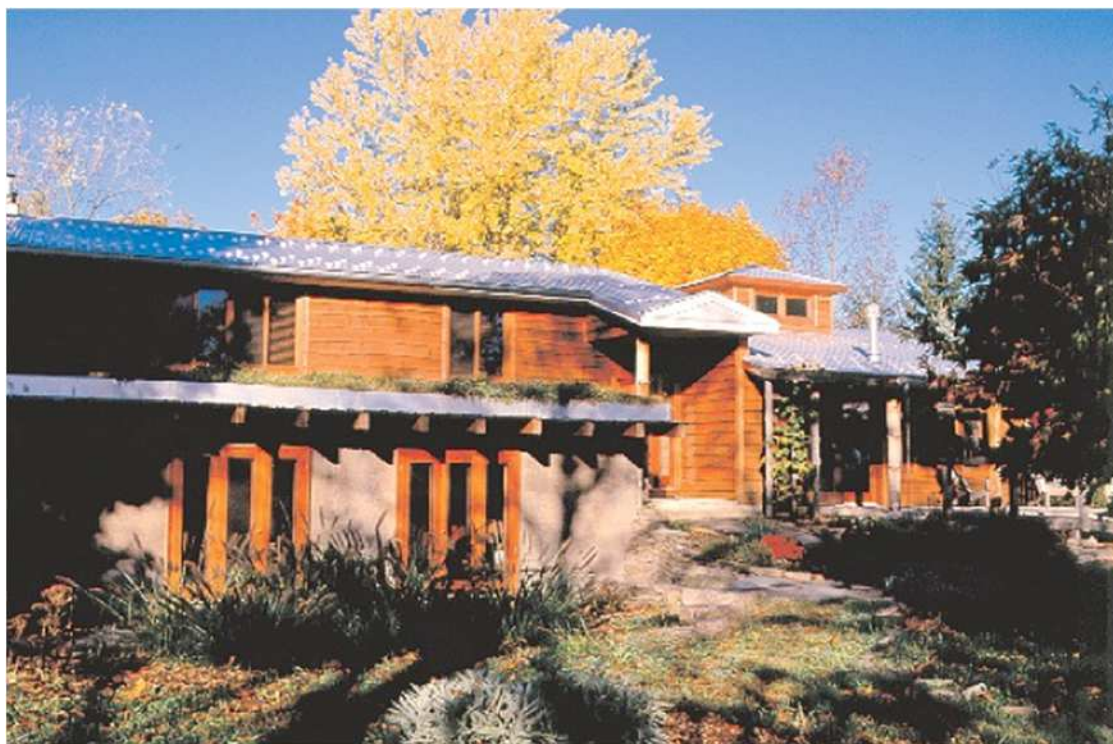




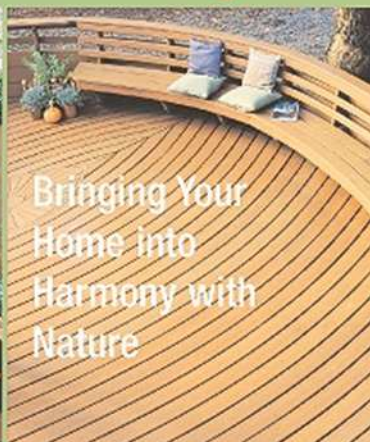




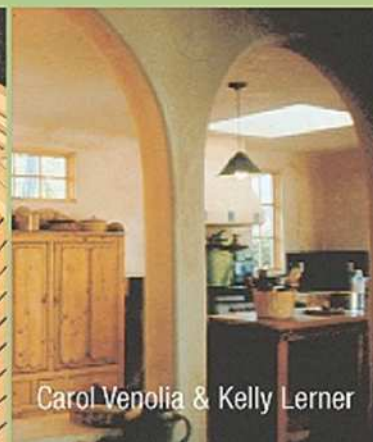




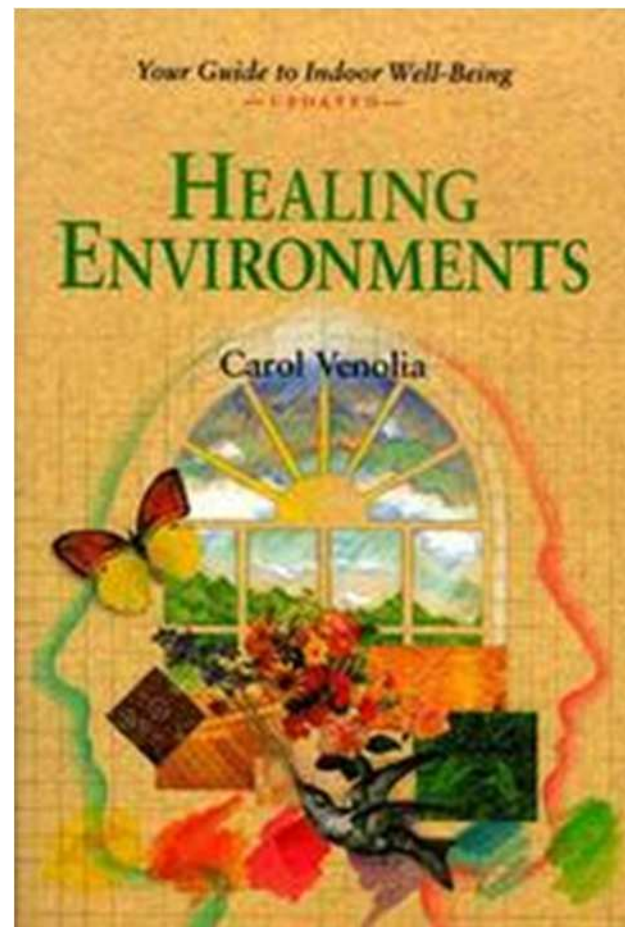
natural remodeling for the Not-So-Green House



Bringing Your
Home into
Harmony with
Nature



Carol Venolia & Kelly Lerner



COME HOME TO NATURE

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